OIB - WP-3D Orion 04/19/16 Science Report

Aircraft:
WP-3D Orion (See full schedule)
Date:
Tuesday, April 19, 2016
Mission:
OIB
Mission Location:
GR
Mission Summary:

This was a successful flight of the sea ice Eureka line, the purpose of which was to obtain cal/val data coincident with a survey team from Environment and Climate Change Canada taking ground measurements of snow depth. Weather was quite good overall on the survey line near Eureka with some clouds present at the southern end of the flight line, although the clouds were optically thin enough for the ATM instrument to range through. At the beginning of the mission we flew a line in the Nares Strait to obtain data over smooth snow-free ice and open water to determine the transmit pulse shape of the snow/Ku radars from coherent scattering returns, but found only wind-roughened water and snow-covered ice which were likely not suitable targets. Having spotted more suitable ice earlier on the high altitude transit from Thule, we broke off the beginning line early to save time, then obtained good data on the return transit to Thule passing over a section of newly frozen sea ice. Conditions of the Eureka survey line appeared to be generally smooth ice with minor topographic features, but a few more deformed ice areas were spotted which should make for some variety of surface roughness in the data set. This flight was conducted at a slightly higher altitude than usual of 1650 feet to optimize the radar data.

The primary radar data system failed upon take-off, but was quickly fixed using a back-up system that allowed good data to be taken during the survey lines.

The ATM optical window had been experiencing fouling due to fluid of unknown origin leaking from the airplane during the test and transit flights, and this was seen in the data about 3 hours into the flight. A deflector shield was installed before the campaign start to reduce leaking of fluid onto the ATM optical window, however the shield size was large enough to block a portion of the telescope field of view for some of the forward shots. It is estimated that this will cause a reduction in power on the order of ~10% and lead to some asymmetry in the return power vs. azimuth angle, though this will not affect the retrieval of surface elevation due to the small footprint size of the laser.

All other instruments operated nominally.

Data volumes:
ATM: 44 Gb some window contamination later in flight
FLIR: 4Gb
DMS: 41 Gb
Ku-Band Radar: 75 Gb
MCoRDS: 0 Tb (Tx cal only)
Snow Radar: 75 Gb

Total data collection time: 6.0 hr

Submitted by:
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File:
eureka_map.pdf